



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,969	01/15/2004	Shing Chuang	14233.67	4264
21999	7590	01/07/2009	EXAMINER	
KIRTON AND MCCONKIE 60 EAST SOUTH TEMPLE, SUITE 1800 SALT LAKE CITY, UT 84111			HOUSHMAND, HOOMAN	
			ART UNIT	PAPER NUMBER
			2419	
			MAIL DATE	DELIVERY MODE
			01/07/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendments and arguments filed on 10/07/2008 have been fully considered.
2. Claims 1, 12, 17 are amended. Claims 1-4, 7-19, 21 are pending.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-4, 7-19, 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
5. The new limitation, claim 1 lines 6-10, was not described in the original disclosure.
6. The new limitation, claim 17 lines 3-8, was not described in the original disclosure.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-4, 7-19, 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
9. The new limitation, claim 1 lines 6-10, is unclear.
10. The new limitation, claim 17 lines 3-8, is unclear.
11. Amended claim 12 is unclear.

### ***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 7-19 and 21 (as best understood) are rejected under 35 U.S.C. 102(e) as being anticipated by Kadambi (PGPUB 20050232274).

Regarding **Claim 1**. Kadambi teaches *a method for allocating* (Once the higher priority queues achieve their minimum bandwidth value, class of service manager 133 allocates any remaining bandwidth based upon any occurrence of exceeding the maximum bandwidth for any one priority queue Page 32 para 394 lines 15-20) *data packet flows*

Art Unit: 2419

(packet flow is controlled by egress managers para 390 p 31 lines 12-13, Realtime applications can be implemented through a Maximum Allowable Latency Parameter, which enables COS manager 133 to schedule packet transmission such that packets on a particular COS queue are not delayed for more than a maximum allowable latency time para 290 p 22 lines 24-29) *among a plurality of data channels* (Para 71 p 3 lines 1-2: any number of ports can be provided) *of a network node* (packets are forwarded by the nodes within the network para 292 p 22 lines 13-14), *classifying* (classify and forward traffic entering the switch based upon predetermined policies para 292 p 22 lines 17-18. based upon the packet classification, actions including sending of the packet to other ports, sending the packet on certain priority queues Para 236 P 17 lines 9-12, sending the packets to a mirrored port Para 239 p 17 lines 3-6) *data packets to be transmitted via data channels into a plurality of data packet flows, a first data packet flow is assigned to and then queues* (Queue value used when sending the Packet to the Egress Port para 307 p 22, each EPIC and each GPIC contains a FIFO queue para 334 p 26 line 16 output queue for a particular port para 386 p 30 line 24 packet sent to the appropriate output queue para 386 p 30 line 42) *in a first data channel to be transmitted* (first data packet destined for a given address para 223 p 15 lines 1-3, first transmission link para 7 p 1 line 12); *obtaining a first flow index according to the amount of first data packet flow and the amount of a second data packet flow* (page 1 paragraph [0007] determining a flow rate of the first frame and the second frame entering the link aggregation environment. Then a step of determining if the flow rate (the sum of the rate of the first frame and the second frame) exceeds a predetermined flow rate threshold.

Art Unit: 2419

Paragraph 289 page 21 lines 8-9: the rate or flow, of the stream of packets selected by a classifier), *first data packet flow queues in first data channel, and second data packet flow is assigned to first data channel* (a first data packet and a second data packet come into a single port interface controller 20 para 221 p 14 lines 2-3) *behind first data packet flow and has the least data packet amount at a specified* ([0451] first packet needs to be smaller than the second before the packet is determined to be a candidate for switching; para 7 p 1 load balancing in a link aggregation environment, determining a flow rate of the first frame and the second frame entering the link aggregation environment, determining if the first frame and the second frame are candidates for link switching; Fig. 49, 50, 51, 53, 54, 55) *time point among data packet flows; and determining whether second data packet flow is to be transferred from first data channel to another data channel* (determining if the second frame is a candidate for link switching para 7 p 1 lines 9-10) *to be transmitted according to a comparing result of first flow index and a threshold value* (method for load balancing in a link aggregation environment including the steps of determining a length of a first frame and a length of a second frame entering the link aggregation environment. Thereafter, determining a flow rate of the first frame and the second frame entering the link aggregation environment. Then a step of determining if the flow rate exceeds a predetermined flow rate threshold is undertaken, and thereafter, a step of determining if the first frame and the second frame are candidates for link switching is completed. As a final step, the method switches a transmission link for the second frame from a first transmission link to a second transmission link para 7 p 1).

Regarding **Claim 2**. Kadambi teaches *step of classifying* (classify and forward traffic entering the switch based upon predetermined policies para 292 p 22 lines 17-18.

Based upon the packet classification, actions including sending of the packet to other ports, sending the packet on certain priority queues Para 236 P 17 lines 9-12, sending the packets to a mirrored port Para 239 p 17 lines 3-6) *data packets into data packet flows: performing an operation of a specified tag value* (para [0191] p 12 Tag Identifier as described in IEEE 802.1Q standard) *included in each of data packets to obtain respective feature values* ([0186] p 11 identifies the Trunk selection. the destination address. Source Mac Address. Destination Mac Address. Source IP Address.

Destination IP Address) *of data packets; and classifying the data packets having the same feature value in the same data packet flow* (para [0210] p 12 placing all similarly tagged members in ports. Para 212 p 12 port bitmap identifies all of the ports on which the packet should be sent).

Regarding **Claim 3**. Kadambi teaches *tag value includes a destination media access control (DMAC) address, an internet protocol (IP) address and a transmission control protocol (TCP) address* ([0186] p 11 Destination Mac Address. IP Address) ([0239] p 17 lines 8-11 filtering logic selectively parses predetermined fields from the incoming data packets, obtaining the values of MAC, IP, TCP).

Regarding **Claim 7**. Kadambi teaches *transference determining step: obtaining a second flow index according to the amount of second data packet flow and the amount of a third data packet flow queuing in a second data channel* (Para 71 p 3: any number of ports can be provided) *where second data packet flow is to be transferred when first flow index is greater than threshold value; and transferring second data packet flow from first data channel to second data channel to be transmitted when second flow index is no greater than threshold value* (The reference teaches that multiple frames with different flow rates can be carrier over a link. When the aggregate flow rate exceeds a threshold, another link is selected to carry the additional load. The new link has to be underutilized to carry this extra load Para 7 p 1, [0164] p10).

Regarding **Claim 8**. Kadambi teaches *transference determining step: obtaining a second flow index according to the amount of second data packet flow and the amount of a third data packet flow queuing in a second data channel where second data packet flow is to be transferred when first flow index is greater than threshold value; and remaining second data packet flow to be assigned to first data channel when second flow index is greater than threshold value* (The reference teaches that multiple frames with different flow rates can be carrier over a link. When the aggregate flow rate exceeds a threshold, another link is selected to carry the additional load. The new link has to be underutilized to carry this extra load Para 7 p 1, [0164] p10).

Regarding **Claim 9**. Kadambi teaches *transference determining step: obtaining a second flow index according to the amount of second data packet flow and the amount of a third data packet flow queuing in a second data channel* (Para 71 p 3 lines 1-2: any number of ports can be provided) *where second data packet flow is to be transferred when first flow index is greater than threshold value; transferring second data packet flow from first data channel to second data channel to be transmitted when second flow index is no greater than threshold value* (The reference teaches that multiple frames with different flow rates can be carried over a link. When the aggregate flow rate exceeds a threshold another link is selected to carry the additional load. The new link has to be underutilized to carry this extra load Para 7 p 1, [0164] p10); *and remaining second data packet flow to be assigned to first data channel when second flow index is greater than threshold value* (method for load balancing in a link aggregation environment including the steps of determining a length of a first frame and a length of a second frame entering the link aggregation environment. Thereafter, determining a flow rate of the first frame and the second frame entering the link aggregation environment. Then a step of determining if the flow rate exceeds a predetermined flow rate threshold is undertaken, and thereafter, a step of determining if the first frame and the second frame are candidates for link switching is completed. As a final step, the method switches a transmission link for the second frame from a first transmission link to a second transmission link para 7 p 1).



Regarding **Claim 10**. Kadambi teaches *second data channel has the least amount of data packets in queue than the other data channels at a certain time point* (preventing port starvation [0167] p 10 line 6) (when the amount of packets in queue reaches the low watermark value, the port is enabled. This controls the data flow of all ports [0164] p 10).

Regarding **Claim 11**. Kadambi teaches *transference determining step is repetitively performed at a constant interval* (A timer/counter has a preset time period, at the end of which the new port map is provided [0387] p 31 lines 5-9).

Regarding **Claim 12**. Kadambi teaches *a step of transmitting a broadcast data packet* ([0104] p6 Broadcast that identifies the port the packet should be sent to) ([0091] - [0131] fig. 3, 5, 6, fig. 8 element 14a ingress submodule, 16a egress submodule, 81 C channel, P channel, S channel, fig. 10, 13, fig. 14 element 81 C\_CHNL, 82 P\_CHNL, 83 S\_CHNL, 142 Input FIFO, fig. 16 elements 81-83) *following first data packet flow via first data channel if second data packet flow is determined to be transferred from first data channel to a second data channel* (packet assembly and notification to the respective ports, rerouting of packets via a global buffer manager, as well as handling packet flow [0161] p 9 lines 3-6).

Regarding **Claim 13**. Kadambi teaches *second data packet flow starts to be transferred* (transferring multiple packets of data (line 13); transferring cells, checking active ports,

Art Unit: 2419

queue availability [0403] p 33 lines 21-24) *via second data channel after broadcast data packet is received by at least one of data channels* (if the incoming packet were a broadcast packet, each egress manager 76 to which the packet is directed will receive the PID [0392] p 31 lines 12-14).

Regarding **Claim 14**. Kadambi teaches *second data packet flow starts to be transferred via second data channel after a preset time period* (the link is switched, determined by the preset threshold value [0450] p 38 line 17-18. After every arbitration time period the next I/O module with a valid request would be given access to the C channel 81 [0090] p 5 lines 8-9. A timer/counter has a preset time period, at the end of which the new port map is provided [0387] p 31 lines 5-9) *from the insertion of broadcast data packet to be transmitted via the first data channel* (for broadcast messages, the message is forwarded to uncongested ports [0386] p 31 lines 54-56).

Regarding **Claim 15**. Kadambi teaches *second data packet flow starts to be transferred* (transferring multiple packets of data (line 13); transferring cells, checking active ports, queue availability [0403] p 33 lines 21-24) *via second data channel after broadcast data packet is received by one of data channels* (the incoming packet is a broadcast packet, each egress manager 76 to which the packet is directed will receive the PID. [0392] p 31 lines 12-14), *and if there is no data channel receiving broadcast data packet at the end of a preset time period, second data packet flow starts to be transferred via second data channel* (the link is switched, determined by the preset threshold value [0450] p 38

Art Unit: 2419

line 17-18) (After every arbitration time period the next I/O module with a valid request would be given access to the C channel 81 [0090] p 5 lines 8-9) (A timer/counter has a preset time period, at the end of which the new port map is provided [0387] p 31 lines 5-9).

Regarding **Claim 16**. Kadambi teaches *broadcast data packet comprises an identifying code of second data packet flow* ([0104] p6 Broadcast that identifies the port the packet should be sent to).

Regarding **Claim 17**. Kadambi teaches *a method for allocating* (Once the higher priority queues achieve their minimum bandwidth value, class of service manager 133 allocates any remaining bandwidth based upon any occurrence of exceeding the maximum bandwidth for any one priority queue Page 32 para 394 lines 15-20) *data packet flows among a plurality of data channels of a network node, classifying* (classify and forward traffic entering the switch based upon predetermined policies para 292 p 22 lines 17-18. based upon the packet classification, actions including sending of the packet to other ports, sending the packet on certain priority queues Para 236 P 17 lines 9-12, sending the packets to a mirrored port Para 239 p 17 lines 3-6) *data packets to be transmitted via data channels into data packet flows, a first data packet flow queues in a first data channel to be transmitted, and a second data packet flow is assigned to first data channel behind first data packet flow and has the least data packet amount at a specified* ([0451] first packet needs to be smaller than the second before the packet is

Art Unit: 2419

determined to be a candidate for switching; para 7 p 1 load balancing in a link aggregation environment, determining a flow rate of the first frame and the second frame entering the link aggregation environment, determining if the first frame and the second frame are candidates for link switching) *time point among data packet flows; transferring second data packet flow from first data channel to another data channel to be transmitted* (determining a flow rate of the first frame and the second frame entering the link aggregation environment. Then a step of determining if the flow rate exceeds a predetermined flow rate threshold is undertaken, and thereafter, a step of determining if the first frame and the second frame are candidates for link switching is completed. As a final step, the method switches a transmission link for the second frame from a first transmission link to a second transmission link para 7 p 1 lines 5-13) *and transmitting a broadcast data packet* ([0104] p6 Broadcast that identifies the port the packet should be sent to) *after first data packet flow via first data channel when the amounts of first data packet flow, second data packet flow and a third data packet flow queuing in another data channel comply with a predetermined relationship* (classify and forward traffic entering the switch based upon predetermined policies para 292 p 22 lines 17-18); *and transmitting second data packet in response to broadcast data packet* (the incoming packet is a broadcast packet, each egress manager 76 to which the packet is directed will receive the PID. [0392] p 31 lines 12-14).

Regarding **Claim 18**. Kadambi teaches *predetermined relationship is that the sum of the amounts of first data packet flow and second data packet flow is greater than a*

Art Unit: 2419

*threshold value* (determining a flow rate of the first frame and the second frame entering the link aggregation environment. Then determining if the flow rate exceeds a predetermined flow rate threshold para 7 p 1), *and the sum of the amounts of third data packet flow and second data packet flow is no greater than a threshold value* (For every port, there is a low watermark and a high watermark; if cell count is below the low watermark, the packet is admitted [0167] p10 lines 3-6).

Regarding **Claim 19**. Kadambi teaches *second data packet flow starts to be transferred* (transferring multiple packets of data (line 13); transferring cells, checking active ports, queue availability [0403] p 33 lines 21-24) *after broadcast data packet is received by at least one of data channels* (if the incoming packet were a broadcast packet, each egress manager 76 to which the packet is directed will receive the PID [0392] p 31 lines 12-14), *and if there is no data channel receiving broadcast data packet at the end of a preset time period, second data packet flow also starts to be transferred* (the link is switched, determined by the preset threshold value [0450] p 38 line 17-18) (After every arbitration time period the next I/O module with a valid request would be given access to the C channel 81 [0090] p 5 lines 8-9) (A timer/counter has a preset time period, at the end of which the new port map is provided [0387] p 31 lines 5-9).

Regarding **Claim 21**. Kadambi teaches *broadcast data packet comprises an identifying code of second data packet flow* ([0104] p6 Broadcast that identifies the port the packet should be sent to).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadambi, in view of Vepa (US 6567377).

Regarding **Claim 4**, Kadambi teaches *tag value includes a destination media access control (DMAC) address, an internet protocol (IP) address and a transmission control protocol (TCP) address* ([0186] p 11 Destination Mac Address. IP Address), ([0239] p 17 lines 8-11 filtering logic selectively parses predetermined fields from the incoming data packets, obtaining the values of MAC, IP, TCP);

In addition, Kadambi teaches *operation is an exclusive OR (XOR) operation* ([0338] p 27 lines 79-80: the source MAC address is XORED with the destination MAC address).

Kadambi does not explicitly teach *operation is an exclusive OR (XOR) operation involving IP, TCP*.

In the same field of endeavor, Vepa discloses *operation is an exclusive OR (XOR) operation involving IP, TCP* (7:45-67).

It would have been obvious to a person having ordinary skill in the art, at the time that the invention was made, to combine the teachings of Vepa with Kadambi to perform load balancing.

### ***Response to Arguments***

15. Applicant's arguments with respect to amended claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hooman Houshmand whose telephone number is (571)270-1817. The examiner can normally be reached on Monday - Friday 8am - 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571)272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. H./  
Examiner, Art Unit 2419

/Hassan Kizou/  
Supervisory Patent Examiner, Art Unit 2419